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United States Lab set to fulfill its destiny

With solar arrays installed and unfurled to supply all the power it needs, the U.S. Destiny Laboratory is ready to assume its place in International Space Station Program history.

The primary objective of STS-98, ISS Assembly Mission 5A, is to deliver and install Destiny onto the ISS. As the centerpiece of research on this world-class scientific orbiting outpost, this workshop in space will support research in cancer, diabetes, and materials, just to name a few.

The Laboratory module is a pressurized, environmentally controlled element. It provides equipment for research and technology development and houses ISS environmental and data management systems. The Lab provides a shirtsleeve environment for long-duration crew activities and operations.

The aluminum module is 28 feet long and 14 feet wide. It is comprised of three cylindrical sections and two endcones that contain the hatch openings through which crewmembers will enter and exit the module. The Lab will be mated to the forward port of Unity (Node 1).

Inside Destiny are five systems racks that will provide life-sustaining functions on board including electrical power, cooling water, air revitalization, and temperature and humidity control. Each rack weighs about 1,200 pounds. Six

additional systems racks and one payload rack will be flown to Destiny on the next flight. Four stand-offs provide raceways for module utilities—interfaces for ducting, piping, and wiring to be run to/from the individual racks and throughout the Lab. Thirteen racks that will provide platforms for a variety of scientific experiments will follow on subsequent missions.

The Lab has an optical quality window (principally for Earth science observations) and a window shutter to protect the window from potential micrometeoroid and orbital debris strikes during the life of the ISS. The crew manually opens the shutter when the window needs to be used. The shutter will be installed during the third scheduled space walk during the mission.

Crewmembers will work inside the pressurized facility to conduct research in numerous scientific fields. Scientists throughout the world will

use the research results to enhance their studies in medicine, engineering, biotechnology, physics, materials science, and Earth science.

The STS-98 crew aboard *Atlantis* includes Commander Ken Cockrell, making his fourth flight; Pilot Mark Polansky (first flight); and Mission Specialists Bob Curbeam (second flight), Tom Jones (fourth flight) and Marsha Ivins (fifth flight).

The flight will be the seventh space shuttle mission in support of the assembly of the ISS. Jones and Curbeam will install the U.S. Lab to the forward port of Unity and perform external outfitting over the course of three space walks.

Pressurized Mating Adapter 2 (PMA 2) will be unberthed from Unity and temporarily stowed on the Z1 Truss. The Lab will then be berthed to Unity; PMA 2 will then be removed from the Z1 Truss and berthed to the Lab's forward Common Berthing Mechanism.

Lab installation activities will begin on Flight Day 4 with Extravehicular Activity (EVA) 1. Key activities planned for EVA 1 include connecting all of the critical power and fluid umbilicals between the Z1 Truss and the Lab. The ISS crew will complete Node to Lab vestibule outfitting toward the end of the EVA. Together these connections will permit Lab activation upon completion of the space walk.

After the Lab is activated and cooling has been established to avionics, the ground will take over activation of the Lab systems. The Pressure Control Assembly (PCA) will be activated, followed by smoke detectors in the Lab. Then the Common Cabin Air Assembly will be started to provide air circulation and scrubbing of the Lab atmosphere. The Guidance, Navigation and Control Multiplexer/Demultiplexers (MDMs) will then be activated and loaded with the appropriate software. The Lab Power Management Controller Unit MDMs will be checked out as well. The ground will then command the Emergency Egress



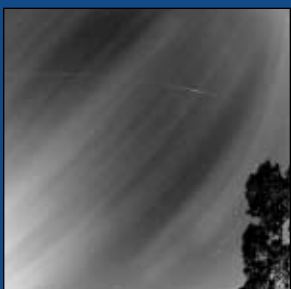
STS-98 crewmembers take part in Crew Equipment Integration Test (CEIT).

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Scientific community awaits Destiny launch.

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STS-97 and the International Space Station flyby.

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The year 2000 reviewed in pictures.

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